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EXAMINER	
PAUL, DISLER	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/692,769	JANG ET AL.	
	Examiner	Art Unit	
	DISLER PAUL	2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 October 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *3-6,8,9 and 11-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *3-6,8,9,11 and 13-20* is/are rejected.

7)☒ Claim(s) *12* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection and thus a new non-final office action is issued.

Claim Rejections - 35 USC § 112

2. Claim 14 recites the limitation "wherein the acoustic environment equalizer". There is insufficient antecedent basis for this limitation in the claim.

For prior art, rejection claim 14, will be read as:"wherein an acoustic equalizer".

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 4; 8-9, 11, 13; 15-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Guillaume Potard (XP-002266903).

Re claim 9, Potard disclose of an object-based three-dimensional audio terminal system

comprising: an audio decoding unit demultiplexing and decoding a multiplexed audio signal including object sounds, background sounds, and scene information applied through a medium wherein the audio decoding unit comprises a demultiplexer for demultiplexing data applied through the medium and multiplexed to separate them into background sound object data, sound source data, and audio scene information data and a decoder for decoding the background sound object data, the sound source data, and the audio scene information data separated by the demultiplexer ;
an audio scene-synthesizing unit selectively synthesizing the object sounds with the audio scene information decoded by the audio decoding unit into a 3-D audio scene under the control of a user (*Abstract; Table-1; par [2.1-2.3]*/end-user with decoding of parameter of scenes including sound/obstruct/rooms of varying and under the user control interactively and inherency of demultiplexer as having end-user of the multiple sounds), the audio scene-synthesizing unit including a sound source object processor for receiving the background sound objects, the sound source objects and the audio scene information data and an object mixer for mixing the sound source objects processed by the sound source object processor with the background sound objects decoded by the audio decoding unit to output the results a user control unit providing a user interface so as to selectively synthesize the audio scene by the audio scene synthesizing unit under the control of the user; and an audio reproducing unit reproducing the 3-D audio scene synthesized by the audio scene-synthesizing unit (fig.5; par [3.1-3.3] total scenery and synthesizing under user control may be process and output).

Re claim 11, the system according to claim 9, wherein the sound source object processor receives the background sound objects, the sound source objects, and the audio scene information decoded by the audio decoding unit to process the sound source objects and audio scene information according to a motion, a relative location between the sound source objects, and a three-dimensional location of the sound source objects, and spatial characteristics under the control of the user (fig.5-6; par [3.1-3.3.1]/under user control with audio scenes parameters and spatial characteristic is provided).

RE claim 13, the system according to claim 9, wherein the audio reproducing unit includes: an acoustic environment equalizer equalizing the acoustic environment between a listener and a reproduction system in order to accurately reproduce the 3-D audio transmitted from the audio scene synthesizing unit; an acoustic environment corrector calculating a coefficient of a filter for the acoustic environment equalizer's equalization, and correcting the equalization by the user; and an audio signal output device outputting a 3-D audio signal equalized by the acoustic environment equalizer(par [3.3-3.4]with user control for characteristic of environment and filter corrections all by the user control).

Re claim 15, the system according to claim 9, wherein the user control unit includes an interface that controls each sound source object and the listener's direction and position, and receives the user's control for maintaining realism of sound reproduction in a virtual space to transmit a control signal to each unit (Table 1; par [2.1-2.2;]; fig.5/with user to control parameters).

Re claim 16, Potard disclose of a method of controlling an object-based 3-D audio terminal system comprising: in receiving and outputting an object-based 3-D audio signal, decoding the audio signal applied through a medium, and dividing the audio signal into object sounds, 3-D information, and background sounds performing motion processing, group object processing, 3-D sound localization, and 3-D space modeling on the object sounds and the 3-D information to modify and apply the processed object sounds and 3-D information according to a user's selection, and mixing them with the background sounds; and equalizing the mixed audio signal in response to correction of characteristics of the acoustic environment that the user controls, and outputting the equalized signal (par [2.1-2.3;3.3] Table-1; fig.5-7/multiple parameters and control as in space and localization as all with user control).

Re claim 17, the method according to claim 16, wherein synthesizing the audio scene further includes: processing a motion effect of each object moving with a particular trajectory, in response to a control signal output from a user control unit; grouping the object, and calculating and processing a relative location of each grouped object;

processing 3-D sound localization by providing each sound source object having a location defined on 3-D coordinates with directivity in response to a listener's position; processing 3-D space modeling by providing the object with a sense of closeness and remoteness and spatial effects according to characteristics of a 3-D space; and mixing the processed sound source object with the background sound object to synthesize a 3-D audio scene (par [2.3; 2.5.2; 2.6;]; fig.3;fig.6-7; andTable-1/user control to mix parameters and have localization and space all with user controls).

Re claim 18, the method according to claim 16, wherein outputting the audio scene further includes: equalizing the 3-D audio output according to information on characteristics of the acoustic environment between a listener and the audio system, and information on correcting the acoustic environment applied by the user; and outputting the equalized 3-D audio scene to provide the same to the listener (see claim 13 rejection analysis).

RE claim 19, Potard disclose of an audio input unit receiving object-based sound sources through input devices an audio editing/producing unit separating the sound sources applied through the audio input unit into object sounds and background sounds according to a user's selection (Abstract; 1-2.1]/user to at end-user decoding to separate the sounds all with user controls), and converting them into three-dimensional audio objects; an audio encoding unit encoding 3-D information of the audio objects and object signals converted by the audio editing/producing unit to transmit them through a

medium; an audio decoding unit receiving the audio signal including object sounds and 3-D information encoded by the audio encoding unit through the medium, and decoding the audio signal; an audio scene synthesizing unit selectively synthesizing the object sounds with 3-D information decoded by the audio decoding unit into a 3-D audio scene under the control of a user; a user control unit outputting a control signal according to the user's selection so as to selectively synthesize the audio scene by the audio scene synthesizing unit under the control of the user; and an audio reproducing unit reproducing the audio scene synthesized by the audio scene synthesizing unit(fig.5; par [3.1-3.3]; fig.5-7/ total scenery and synthesizing under user control may be process and output).

Re claim 20, Potard disclose of a method of controlling an object-based 3-D audio terminal system, comprising: separating sound source objects from among sound sources according to a selection by a user; inputting 3-D information on the separated sound source objects; processing sound sources other than the input sound source objects and 3-D information as background sounds; forming the sound source objects, the 3-D information, and the background sounds into an audio scene, and encoding and multiplexing the audio scene to transmit the encoded and multiplexed audio scene through a medium; decoding the audio signal applied through a medium, and dividing the audio signal into object sounds, 3-D information, and background sounds; performing motion processing, group object processing, 3-D sound localization, and 3-D

space modeling with respect to the object sounds and the 3-D information to modify and apply the processed object sounds and 3-D information according to a user's selection, and mixing them with the background sounds; and equalizing the mixed audio signal in response to correction of characteristics of the acoustic environment that the user controls, and outputting the equalized audio signal (see claim 16 rejection analysis).

Re claim 4, the system according to claim 19, wherein the audio editing/producing unit includes: a router/audio mixer dividing the sound sources applied in the multi-track format into a plurality of sound source objects and background sounds; a scene editor/producer editing an audio scene and producing the edited audio scene by using 3-D information and spatial information of the sound source objects and background sound objects divided by the router/audio mixer; and a controller providing a user interface so that the scene editor/producer edits an audio scene and produces the edited audio scene under the control of a user(Table-1; fig.2; 5-7; par [3.1-3.4]/end user control for editing and controlling sound parameters).

Re claim 8, the method according to claim 20, wherein each of the sound source objects further includes 3-D information for a relative sound source object by grouping the sound source objects that have to be controlled by groups (par [2.2,2.3.1]/object with may be groups for 3-D).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Guillaume Potard (XP-002266903) and Sibbald (US 6,498,857).

Re claim 14, the system according to claim 9, wherein an acoustic environment equalizer further includes: means for equalizing the environmental characteristics between a listener and the audio terminal system in order to accurately reproduce 3-D audio;; and means for correcting the characteristics of the acoustic environment automatically or in response to the user's input, according to the information on speakers of the audio system, a listening room's construction, and arrangement of speakers, transmitted from the acoustic environment corrector (Tabe-1; par [2.1-2.3;3.3; 3.3.1; fig.5-6/all under user control to correct acoustic environment and output to speakers).

However, Potard fail to disclose of the means for canceling crosstalk transmitted to right and left ears of the listener. But, Sibbald disclose of a synthesizing sound wherein the means for canceling crosstalk transmitted to right and left ears of the listener (fig.6, 10-11; col.2 line 35-52). Thus, taking the combined teaching of Portard

and Sibbald as a whole, it would have been obvious for one of the ordinary skill in the art to have modified Sibbald with the means for canceling crosstalk transmitted to right and left ears of the listener for improving 3-D sound spatial cues.

7. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Guillaume Potard (XP-002266903) and Leung et al. (US 2005/0080616A1).

Re claim 3, the system according to claim 19, wherein the audio input unit includes: a combination of sound source input devices having: a source separation/3-D information extractor separating the sound sources applied from the combination of the sound source input devices by objects, and extracting 3-D information (Abstract; 3-3.3]/end-users input may selectively modified all object by user at decoder all with user control in 3-D).

But, Potard fail to disclose of the specific wherein a single channel microphone with a single microphone; a stereo microphone with at least two microphones; a dummy head microphone whose shape is like a head of a human body; an ambisonic microphone receiving the sound sources after dividing them into signals and volume levels, each moving with a given trajectory on 3-D X, Y, and Z coordinates; and a multi-channel microphone receiving multitrack audio signals.

However, Leung et al. disclose of a system for recording three-dimensional auditory scene in which the device further include a combination of sound source input devices having:a single channel microphone with a single microphone (par [0003-0004/mono microphone); a stereo microphone with at least two microphones ("*page 1[0004] line 5-6; page 1[0008] line 11-14")* a dummy head whose shape is like a head of a human body ("*page 1[0008]*"); an ambisonic microphone receiving the sound sources after dividing them into signals and volume levels, each moving with a given trajectory on 3-D X, Y, and Z coordinates ("*page 1[0005]*"); and a multi-channel microphone receiving multitrack audio signals ("*page 1[0008] line 3*"). Thus, taking the combined teaching of Potard and Leung et al. as a whole, it would have been obvious for one of the ordinary skill in the art to modify Potard by incorporating the stereo microphone, a dummy head microphone, an ambisonic microphone, a multi-channel microphone for the purpose of recording 3-D auditory scene sound signals.

8. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guillaume Potard (XP-002266903).

Re claim 5, the system according to claim 19 (with encoding and decoding of multiple sound signals for transmission), But, Potard fail to disclose of the specific wherein the audio encoding unit includes: a data encoding block encoding each set of data divided into background sound objects, sound source objects, and audio scene information

output from the audio editing/producing unit; an a multiplexer multiplexing object data of the background sound, data of the sound sources, and data of the audio scene information encoded by the data encoding block into a single signal, and transmitting the same. But, it is taken the concept of having such specific wherein the audio encoding unit includes: a data encoding block encoding each set of data divided into background sound objects, sound source objects, and audio scene information output from the audio editing/producing unit; an a multiplexer multiplexing object data of the background sound, data of the sound sources, and data of the audio scene information encoded by the data encoding block into a single signal, and transmitting the same is simply the designer's preference. Thus, it would have been obvious for one of the ordinary skill in the art to have modified Potard with the above for creating interactive 3-D sound signals.

Re claim 6, the system according to claim 5, wherein the data encoding block includes: an audio object encoder encoding the sound objects; an audio scene information encoder encoding the audio scene information; and a background sound object encoder encoding the background sounds (fig.2, 6; Table-1; par [1-2.1, 2.3 2.5]/sound and scene and other objects all to be encoding).

Allowable Subject Matter

9. Claim 12 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

While, Potard disclose of the above with processing and sound effect for localization of the environment, but, Potard fail to disclose of such specific wherein the sound source object processor further includes: a motion processor analyzing a plurality of sound source data and the audio scene information, calculating a location of each sound source object moving with its particular trajectory, and modifying its trajectory under the control of the user through the user control unit; a group object processor calculating a relative location of the respective sound source objects when a plurality of the sound source objects is grouped, and controlling the relative location of the sound source objects under the control of the user through the user control unit; a 3-D sound localization processor providing each sound source object having a location defined on 3-D coordinates with directivity in response to a listener's location under the control of the user control unit; and a 3-D space modeling processor providing a sense of closeness and remoteness and spatial effects to each sound source object according to characteristics of a 3-D space

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DISLER PAUL whose telephone number is (571)270-1187. The examiner can normally be reached on 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chin Vivian can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. P./
Examiner, Art Unit 2614

/Xu Mei/
Primary Examiner, Art Unit 2614